

REMARKS/ARGUMENTS

Applicants have received and carefully reviewed the Office Action of the Examiner mailed August 9, 2006. Claims 1, 3-38, and 40-50 remain pending, with claims 13-37 withdrawn from consideration. Reconsideration and reexamination are respectfully requested.

Rejection under 35 U.S.C. § 103(a)

Claims 1 and 3-6 are rejected as being unpatentable over Hansen et al. (US 4,973,561) in view of Kawabata et al. (US 5,691,205). The Examiner asserts that Hansen et al. teach a flow cell having a permeable membrane 7, a light source 4 and a light detector 6 adjacent the flow cell. The Examiner acknowledges that Hansen et al. do not specifically teach that the light source and light detector are located at first and second ends of the enclosure, or that there is a processor connected to the light detector, or an indicator connected to the processor. The Examiner cites Kawabata et al. as teaching a flow cell with a light source and detector on opposite ends of the flow cell. The Examiner then asserts that it would have been obvious to one of ordinary skill in the art to modify the flow cell/sensor system of Hansen et al. to have the light source and detector at first and second ends of the enclosure for the purpose of more accurate measurement.

Applicants respectfully traverse the rejection. Hansen et al. appear to teach a bundle of optical fibers 9 for providing light 4 to the membrane 7, where reflected light 6 is returned to a sensor (not shown in the figures). See column 1, lines 56-62, column 2, lines 20-21, column 4, lines 60-68, and FIG. 2. Hansen et al. thus appear to teach a device having an optical fiber bundle 9 that both transmits light 4 and receives reflected light 6, where the light source and light detector are located distant from the flow cell. Applicants submit that there is no motivation or suggestion for combining the teachings of Hansen et al. and Kawabata et al. As discussed above, Hansen et al. teach an optical fiber bundle for transmitting light to 4 and receiving reflected light from 6 the membrane 7. Hansen et al. teach that "microconduits with integrated optical fibres

became an ideal vehicle for this purpose" with respect to the use of the flow cell in manufacture. See column 4, lines 54-62. Hansen et al. thus appear to teach the use of a multistrand optical fiber as having specific advantages. Additionally, Hansen et al. appear to teach the their device as involving the detection of reflected light from a porous membrane. See column 3, lines 65-68. Looking at FIG. 2, it is apparent that the optical fiber bundle transmits light in a first direction, as indicated by the arrow at reference number 4, and receives the reflected light in an opposite direction, as indicated by the arrow at reference number 6. Applicants submit that there is no motivation for one to modify the device of Hansen et al. to have a light source and light detector at opposite ends of the flow cell in the face of Hansen's specific teaching of a multistrand optical fiber and in light of Hansen's teaching that the multistrand optical fiber as having advantages.

Further, there is no reasonable expectation of success in substituting the light source and detectors at either end of the flow cell, as taught by Kawabata et al. for the optical fiber bundle of Hansen et al. Kawabata et al. teaches a waveguide made of a glass substrate having a thin film of aluminum on the back face f1 and a sensing membrane 7 on the front face f2, and teaches detecting the total reflection from both surfaces f1 and f2. See column 14, lines 47-52 and line 64 through column 15, line 10, and FIG. 9. It appears that the laser light enters one end of the glass substrate 14 and is reflected repeatedly between the thin films f1 and f2 bonded to the glass substrate 14 before emerging from the opposite end of the glass substrate 14. Applicants submit that there is no indication in either Hansen et al. or Kawabata et al. that such reflectance would occur if light were directed at the end of the device of Hansen et al. Because Hansen et al. do not have thin films on opposing sides of the fluid chamber, it would appear that such reflectance would not occur. Thus, substituting the light source and light detecting configuration of Kawabata et al. for the optical fiber bundle of Hansen et al. would appear to render the device of Hansen et al. inoperable.

The Examiner asserts that one of ordinary skill in the art would have been motivated to make the asserted combination of Hansen et al. and Kawabata et al. "for the purpose of more accurate measurement." The Examiner has not, however, provided any reasoning or support for

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this assertion. If this rejection is maintained, Applicants respectfully request the Examiner provide reasons why one of ordinary skill in the art would expect that using the light source and detector at first and second ends of the enclosure of Hansen et al. would result in a more accurate measurement.

The Examiner also asserts that it would have been obvious to one of ordinary skill in the art to use a processor connected to the light detector and an indicator connected to the processor for the purposes of being able to make measurements and see the results. The Examiner has not, however, provided any reference teaching a processor connected to a light detector or an indicator connected to the processor. MPEP 2143.03 states:

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

(Emphasis added). The Examiner has acknowledged that Hansen et al. do not teach a processor connected to the light detector or an indicator connected to the processor, and has not asserted that these elements of claims 5 and 6, respectively, are taught by Kawabata et al. Applicants submit that as neither Hansen et al. nor Kawabata et al. appear to teach or suggest each all the claim limitations of claims 5 and 6, the Examiner has failed to establish a *prima facie* case of obviousness. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 7-9 are rejected as being unpatentable over Hansen et al. in view of Kawabata et al. as applied to claims 1 and 3-6 above, and further in view of Brandon (GB2 208 707). For at least the reasons set forth above, neither Hansen et al. nor Kawabata et al. teach or suggest each and every element of independent claim 1, from which claims 7-9 depend. Brandon does not appear to provide what Hansen et al. and Kawabata et al. lack, thus any combination of Hansen

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et al., Kawabata et al., and Brandon also fails to teach or suggest the elements of dependent claims 7-9.

Claims 10-12 are rejected as being unpatentable over Hansen et al. in view of Kawabata et al. and Brandon as applied to claims 7-9 above, and further in view of Chandler (US 6,592,822). For at least the reasons set forth above, none of Hansen et al., Kawabata et al., Brandon, or a combination thereof teach or suggest each and every element of independent claim 1, from which claims 10-12 depend. Chandler does not appear to provide what Hansen et al., Kawabata et al., and Brandon lack, thus any combination of Hansen et al., Kawabata et al., Brandon, and Chandler also fails to teach or suggest the elements of dependent claims 10-12.

Additionally, there is no motivation for one of ordinary skill in the art to combine the teachings of Hansen et al. and Chandler because they are directed to different devices involving different sensing properties and different components. Hansen et al. appears to be directed to a sensor for detecting volatile species that penetrate the membrane 7 by detecting a color change in the indicator on membrane 7. See column 3, line 56 through column 4, line 2. Chandler is directed to a flow cytometer for analyzing particles in a fluid mixture based on the particles' optical properties when passing through a laser beam. See column 1, lines 19-56. Applicants submit that there is no reason to combine the devices, and even if one were to make such a combination, one would not arrive at the claimed invention. It is not clear how such a combination would be made because the technologies of the two sensors are so different. It appears one would achieve a sensor of Hansen et al. with two lasers as the light source. However, it is not clear how the lasers of Chandler, which create light-scatter patterns when coming in contact with particles and which excite dyes added to the particles would be useful in the color-change detection system of Hansen et al. Applicants submit that the combination of Hansen et al., Kawabata et al., Brandon, and Chandler, even if made, does not teach or suggest each and every element of the claims as amended. Reconsideration and withdrawal of the rejection are respectfully requested.

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Claims 38 and 40-46 are rejected as being unpatentable over Hansen et al. in view of Kawabata et al. in view of Brandon and Chun et al. (US 6,727,099). The Examiner acknowledges that Hansen et al. in view of Kawabata et al. and Brandon fails to teach a tubular permeable membrane enclosure, but asserts that it is well known in the art that permeable membrane enclosures are often tubular in shape, as disclosed by Chun et al. The Examiner also asserts that it would have been obvious to modify the analyzer of Brandon to use a tubular permeable membrane for the purpose of making the device more cheaply or using a specific geometry to make calculations simpler. Applicants respectfully traverse the rejection.

Applicants note that Hansen et al. is the primary reference in this rejection while Brandon is now used only as a secondary reference. The Examiner appears to have repeated the reasons for rejection from the previous Office Action in which Brandon was the primary reference. Applicants submit that as the Examiner has not provided reasons as to why one would have modified the device of Hansen et al. with the teachings of Chun et al.; the rejection appears incomplete and improper. However, assuming the Examiner would have made similar arguments with respect to Hansen et al., the following arguments are presented. Hansen et al. teach a flow cell with one embodiment having a porous hydrophobic membrane 7 separating two liquids. See column 3, lines 53-63, and column 4, lines 54-60. The permeable membrane of Hansen et al. thus appears to be contained within an enclosure. Hansen et al. do not appear to teach an embodiment in which a membrane enclosure has an input and output with a light source proximate a first end of the enclosure and a light detector proximate a second end of the enclosure, as is recited in independent claim 38. Hansen et al. thus do not appear to teach the basic elements of independent claim 38. Neither Kawabata et al., nor Brandon appear to teach or suggest what Hansen et al. lack.

Applicants submit that there is no motivation for one of ordinary skill in the art to substitute a tubular membrane enclosure as taught by Chun et al. for the permeable membrane in the flow cell taught by Hansen et al. Chun et al. appear to teach a tubular membrane through which fluid passes from one end to another, as shown in FIG. 2. The mechanics of the devices of

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Hansen et al. and Chun et al. appear to be quite different, with Chun et al. appearing to teach pumping a fluid through a tubular membrane, where the fluid permeates the membrane along the length of the tubular structure. The device of Hansen et al. appears to involve streaming two different fluids through the length of the flow cell where the fluids are separated from each other by the permeable membrane, but the fluids do not appear to permeate the walls of the flow cell along the length of the flow cell. Applicants submit that one of ordinary skill in the art, upon reading Hansen et al., would not have been motivated to look to Chun et al. for modifications.

Additionally, it is not clear how substituting the tubular membrane structure of Chun et al. for the flat membrane contained within the flow cell of Hansen et al. would make the device of Hansen et al. cheaper or make calculations simpler, as is asserted by the Examiner. Reconsideration and withdrawal of the rejection are respectfully requested. If this rejection is maintained, the Examiner is respectfully requested to explain how the asserted modification would achieve the asserted advantages.

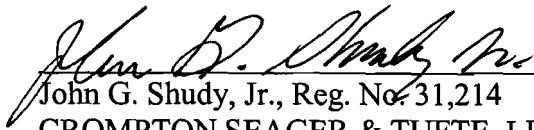
Claims 47-50 are rejected as being unpatentable over Hansen et al. in view of Kawabata et al., Brandon, Chun et al. and further in view of Chandler. For at least the reasons set forth above, the combination of Hansen et al., Kawabata et al., Brandon, and Chun et al. does not appear to teach or suggest the basic elements of independent claim 38, from which claims 47-50 depend. Chandler does not appear to teach what Hansen et al., Kawabata et al., Brandon and Chun et al. lack. Reconsideration and withdrawal of the rejection are respectfully requested.

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Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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